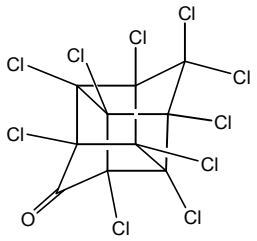
KEPONE® (CHLORDECONE)
CAS No. 143-50-0
First Listed in the *Second Annual Report on Carcinogens*



CARCINOGENICITY

Kepone® (chlordecone) is *reasonably anticipated to be a human carcinogen* based on sufficient evidence of carcinogenicity in experimental animals (IARC S.7 1987; IARC V.20, 1979). When administered in the diet, Kepone® induced hepatocellular carcinomas in rats and mice of both sexes.

There are no adequate data available to evaluate the carcinogenicity of Kepone® in humans (IARC V.20, 1979).

PROPERTIES

Kepone® is the trade name of the synthetic chlorinated insecticide chlordecone, which is a ketone analog and degradation product of mirex (see Mirex, Section III.B). Kepone® is a tan-to-white solid that is practically insoluble in water, but soluble in strongly alkaline aqueous solutions, alcohols, ketones, dimethyl sulfoxide, acetic acid and hydrocarbon solvents such as hexane and benzene. The technical grades usually contain 88.6% to 99.4% chlordecone as an active ingredient.

USE

Kepone® is no longer used in the United States. First introduced in 1958, Kepone® was used until 1978 as an insecticide for leaf-eating insects, ants and cockroaches, and as a larvicide for flies (IARC V.20, 1979). Kepone® was used on bananas, non-bearing citrus trees, tobacco, ornamental shrubs, lawns, turf, and flowers (HSDB, 1989).

PRODUCTION

Chem Sources identified one domestic supplier of chlordecone for 1990 (Chem Sources, 1991). Kepone® is no longer manufactured in the United States (SRI, 1986). In July 1975, the Virginia State Health Department ordered termination of production by the sole manufacturer of Kepone® when several workers developed serious neurological disorders (NIOSHa, 1976). Before the shutdown, the estimated average annual production was 882,000 lb. More than 99% of the production was exported; only 0.8% was available for domestic use, mainly as bait in ant traps (IARC V.20, 1979).

EXPOSURE

The primary routes of potential human exposure to Kepone® are inhalation, ingestion, and dermal contact. Many reports of its occurrence in human body fluids are available. In 1976, NIOSH identified 50 establishments processing or formulating pesticides using the chemical and estimated that about 600 workers were possibly exposed to Kepone® in the workplace (NIOSHb, 1976).

Chlordecone is a degradation product of the insecticide mirex. Investigators have detected chlordecone in soil at a level of 0.02 µg/g of soil 12 years after an application rate of mirex of 1 µg/g. In the United States, detectable levels of chlordecone were found in 400 samples of air, drinking water, plant and aquatic organisms, and municipal waste where Kepone® was manufactured (IARC V.20, 1979). Additional exposure information may be found in the ATSDR Toxicological Profile for Mirex and Chlordecone (ATSDR, 1995f).

Chlordecone is very stable in the environment. No degradations products have been identified. When released to soil, chlordecone will adsorb to soils. Some leeching to groundwater may occur. When released to water, chlordecone will adsorb to the sediment. It will bioaccumuate in fish but not in certain crustaceans. The half-life of chlordecone in a model river is 2.8-46 years. In the air, chlordecone will directly photodegrade or react with photochemically produced hydroxy radicals or ozone. Chlordecone will adsorb into particulate matter in the atmosphere, so it will also be subject to gravitational settling (HSDB, 1989).

REGULATIONS

EPA regulates Kepone® under the Clean Water Act (CWA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), and Resource Conservation and Recovery Act (RCRA). A CWA hazardous spill regulation established a reportable quantity (RQ) of 1 lb and imposed reporting requirements. This RQ also applies to releases regulated under CERCLA. RCRA designates Kepone® as a carcinogen and regulates it under the hazardous waste disposal rule. In 1977, formulators of Kepone® voluntarily cancelled production. EPA cancelled the registration of Kepone® under FIFRA, with all registered products effectively cancelled by 5/1/78. NIOSH has recommended that, in the workplace, Kepone® levels be limited to 1 µg/m^3 as a time-weighted average (TWA) for up to 10 hr per work day and 40 hr per work week. Regulations are summarized in Volume II, Table B-76.